

Form PTO-1390		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTORNEY'S DOCKET NUMBER P20178
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371		U.S. APPLICATION NO. (If known, see 37 CFR 1.5) 09/674508	
INTERNATIONAL APPLICATION NO. PCT/FR99/01158	INTERNATIONAL FILING DATE 14 May 1999	PRIORITY DATE CLAIMED 15 May 1998	
TITLE OF INVENTION MOTOR PUMP WITH AXIAL THROUGH FLOW COMPRISING AN INCORPORATING FLOWMETER AND PRESSURE CONTROLLER			
APPLICANT(S) FOR DO/EO/US Rolland VERSINI			
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information.			
1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371. 2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371. 3. <input checked="" type="checkbox"/> This is an express request to promptly begin national examination procedures (35 U.S.C. 371(f)). 4. <input checked="" type="checkbox"/> The US has been elected by the expiration of 19 months from the priority date (PCT Article 31). 5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2)) a. <input checked="" type="checkbox"/> is attached hereto (required only if not communicated by the International Bureau). b. <input checked="" type="checkbox"/> has been communicated by the International Bureau. c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US). 6. <input type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C. 371 (c)(2)). 7. <input type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)) a. <input type="checkbox"/> are attached hereto (required only if not communicated by the International Bureau). b. <input type="checkbox"/> have been communicated by the International Bureau. c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired. d. <input type="checkbox"/> have not been made and will not be made. 8. <input type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)) 9. <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). 10. <input type="checkbox"/> An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (U.S.C. 371(c)(5)). Items 11 to 16 below concern other document(s) or information included: 11. Assignee: _____ 12. <input type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98. 13. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included. 14. <input type="checkbox"/> A FIRST preliminary amendment. <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment. 15. <input type="checkbox"/> A substitute specification. 16. <input type="checkbox"/> A change of power of attorney and/or address letter. 17. <input checked="" type="checkbox"/> Other items or information: Cover Sheet and International Application as published in French. An Executed Small Entity Status Form. PCT/IB/304(in French). PCT/IB/318(in French). PCT/IB/308(in French). Claim of Priority.			

U.S. APPLICATION NO. (If known, see 37 CFR 1.5) 09/674508		INTERNATIONAL APPLICATION NO. PCT/FR99/01158		ATTORNEY'S DOCKET NUMBER P20178	
18. The following fees are submitted:				CALCULATIONS	PTO USE ONL
<p>Basic National Fee (37 CFR 1.492(a)(1)-(5)):</p> <p>Search report has been prepared by the EPO or JPO. \$ 860.00</p> <p>International preliminary examination fee paid to USPTO (37 CFR 1.482). \$ 690.00</p> <p>No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO(37 CFR 1.445(a)(2)). \$ 710.00</p> <p>Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2) paid to USPTO. \$1,000.00</p> <p>International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4). \$ 100.00</p> <p>ENTER APPROPRIATE BASIC FEE AMOUNT =</p>				\$860.00	
Surcharge of \$130.00 for furnishing the oath or declaration later than <u> 20 </u> <u> 30 </u> months from the earliest claimed priority date (37 CFR 1.492(e)).				\$	
Claims	Number Filed	Number Extra	RATE	\$	
Total Claims	4 - 20 =	0	X \$18.00	\$0.00	
Independent Claims	1 - 3 =	0	X \$80.00	\$0.00	
Multiple dependent claim(s) (if applicable)			+ \$270.00	\$0.00	
TOTAL OF ABOVE CALCULATIONS =				\$860.00	
X Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.				\$430.00	
SUBTOTAL =				\$430.00	
Processing fee of \$130.00 for furnishing the English translation later than <u> 20 </u> <u> 30 </u> months from the earliest claimed priority date (37 CFR 1.492(f)).				+	
TOTAL NATIONAL FEE =				\$430.00	
Fee for recording the enclosed assignment (37 CFR 1.21(h). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property				+	
TOTAL FEES ENCLOSED =				\$430.00	
				Amount to be refunded	\$
				Charged	\$
<p>a. <u> X </u> A check in the amount of <u>\$430.00</u> to cover the above fees is enclosed.</p> <p>b. <u> </u> Please charge my Deposit Account No. <u> </u> in the amount of \$ <u> </u> to cover the above fees.</p> <p>c. <u> X </u> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. <u>19-0089</u>.</p> <p>NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed : granted to restore the application to pending status.</p> <p>SEND ALL CORRESPONDENCE TO CUSTOMER NO. 7055 AT THE PRESENT ADDRESS OF: Abraham HersHKovitz GREENBLUM & BERNSTEIN, P.L.C. 1941 Roland Clarke Place Reston, VA 20191 (703) 716-1191</p>					
				SIGNATURE Abraham HersHKovitz NAME	
				45,294 REGISTRATION NUMBER	

Applicant or Patentee: Rolland VERSINI Attorney's
Serial or Patent No.: not yet assigned Docket No.:
Filed or Issued: concurrently herewith
For: Motor pump with axial through flow comprising an incorporated flowmeter
and pressure

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY
STATUS (37 CFR 1.9(f) and 1.27(b)) - INDEPENDENT INVENTOR

As a below named inventor, I hereby declare that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees under section 41(a) and (b) of Title 35, United States Code, to the Patent and Trademark Office with regard to the invention entitled _____ described in

- ☒ the specification filed herewith
☐ application serial no. _____, filed _____
☐ patent no. _____, issued _____.

I have not assigned, granted, conveyed or licensed and am under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

- ☒ no such person, concern, or organization
☐ persons, concerns or organizations listed below*

*NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

FULL NAME _____
ADDRESS _____
☐ INDIVIDUAL ☐ SMALL BUSINESS CONCERN ☐ NONPROFIT ORGANIZATION

FULL NAME _____
ADDRESS _____
☐ INDIVIDUAL ☐ SMALL BUSINESS CONCERN ☐ NONPROFIT ORGANIZATION

FULL NAME _____
ADDRESS _____
☐ INDIVIDUAL ☐ SMALL BUSINESS CONCERN ☐ NONPROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF INVENTOR NAME OF INVENTOR NAME OF INVENTOR

Rolland VERSINI

Signature of Inventor Signature of Inventor Signature of Inventor

Date Date Date

23 octobre 2000

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : R. VERSINI

Group Art Unit: Unknown

Appl No. : 09/674,508
(National stage of PCT/FR99/01158)

Examiner: Unknown

Filed : November 15, 2000

For : MOTOR PUMP SYSTEM WITH AXIAL THROUGH FLOW
UTILIZING AN INCORPORATED FLOWMETER AND PRESSURE
CONTROLLER**PRELIMINARY AMENDMENT**Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to the examination of the instant continuation application, please enter the following amendment:

In the Specification:

Please replace the title and background of the invention section on page 1 of the specification (i.e., the title and paragraphs 0001 - 0004) with the following section (see Appendix 1 for changes to this section):

**--MOTOR PUMP SYSTEM WITH AXIAL THROUGH FLOW UTILIZING AN
INCORPORATED FLOWMETER AND PRESSURE CONTROLLER**

CROSS-REFERENCE TO RELATED APPLICATIONS

The present application is a National Stage Application of International Application No. PCT/FR99/01158, filed May 14, 1999. Further, the present application claims priority under 35 U.S.C. § 119 of French Patent Application Nos. 98/06431 and 98/10989, both filed on May 15, 1998.

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to an axial through flow motor pump with an incorporated flowmeter and pressure controller.

[0002] The invention is particularly adapted to equip automatic coffee machines, but it can be used for numerous other applications requiring pressurized liquid supply from a reservoir.

2. Discussion of Background Information

[0003] The French Patent No. FR 98 06 431 filed by the Applicant of the present invention describes a coffee machine comprising a motor pump associated with a pressure controller mounted on the supply circuit and making it possible not only to control the water supply system, but also to remove the reservoir to fill it up due to the fact that the pressure controller is constituted of two elements that can be coupled, one of which is fixed on the frame of the machine and the other to the base of the reservoir, each of these two elements being automatically sealed when they are separated.

[0004] The fixed element is connected to the motor pump and is equipped with a flexible membrane acting on an electric contact as a function of the variations in pressure generated by the modifications of the water level in the reservoir. The liquid that penetrates into this element

converges to a single chamber in which the flexible membrane and the outlet orifice toward the motor pump are located. Under certain conditions, this arrangement causes an aberrant functioning of the electric contact, in particular during stops and starts of the motor pump.--

Please replace paragraphs 0005 - 0006 with the following section (see Appendix 2 for changes to this section):

--SUMMARY OF THE INVENTION

[0005] The device according to the present invention provides for a system which uses a motor pump incorporating the assembly of the devices for controlling the liquid flow and connected to a particularly reliable supply pressure controller.

[0006] The invention utilizes an internal axial flow motor pump, with an electromagnetic motor and a hollow free piston, equipped with an incorporated flowmeter and flow limiting device, and associated with a pressure controller adapted to control its supply and comprising separate internal passages for the liquid flow converging to the motor pump and for connecting to a chamber containing a flexible membrane actuating an electric contact for controlling the motor pump power supply.

[0006.1] According to one aspect of the invention, there is provided a motor pump system comprising an electromagnetic motor comprising a main body, a coil, and a movable hollow free piston, a flow meter coupled to one end of the electromagnetic motor, a cylinder block coupled to another end of the electromagnetic motor, at least two non-return valves,

a water inlet, a water outlet, and a pressure limiting device.

[0006.2] The flow meter may comprise a free bucket wheel. The flow meter may further comprise an electromagnetic detector and the free bucket may comprise at least one permanent magnet whose movement is detected by the electromagnetic detector. The pressure limiting device may be a bore provided in the cylinder block and may comprise a calibrated spring-loaded valve which connects the water outlet to a base of the free hollow piston. The motor pump may be adapted to recycle water without driving the flow meter when there is back pressure at the water outlet.

[0006.3] The main body may be one of machined in a single piece and made of plastic. The motor pump may be adapted to couple to an automatic coffee machine. The motor pump may be adapted to couple to a device which requires a pressurized liquid supply from a reservoir. The system may further comprise a pressure controller associated with the motor pump. The pressure controller may comprise a chamber. The chamber of the pressure controller may be adapted to receive liquid flow. The pressure controller may further comprise a flexible membrane actuating an electric contact for controlling an automatic liquid supply system. The pressure controller may comprise an outlet orifice for communicating with the motor pump. The pressure controller may be adapted to receive two liquid flows. One of the two flows may be directed to a chamber in the pressure controller via a central passage and another of the two flows may be directed to an outlet orifice via a

peripheral passage.

[0006.4] The pressure controller may comprise a fixed element and an end piece. The fixed element may be coupled to one of the motor pump and a frame supporting the motor pump. The end piece may be mounted to a reservoir. The reservoir may communicate with and provide a supply to the motor pump. The fixed element and the end piece may be releasably coupled together. The fixed element and the end piece may be releasably coupled together via a quick connection.

[0006.5] The pressure controller may have a fixed element comprising a body, a hollow piece arranged within the body, and two passages separated by the hollow piece. The pressure controller may further comprise an end piece and an axially movable bush disposed within the end piece. The end piece may further comprise a spring associated with the bush which is adapted to close a peripheral passage. The fixed element may be removably coupled to the end piece such that when the fixed element is uncoupled from the end piece, a central passage is closed by a spring actuated valve. The bush may be slidably disposed with the end piece and the fixed element may further comprise a cylindrical shutter which is slidably disposed around the hollow piece. The cylindrical shutter may be biased via a spring. The cylindrical shutter may be adapted to isolate a liquid circuit communicating with the motor pump so as to prevent a liquid remaining in the motor pump from flowing out of the fixed element when the fixed element is uncoupled from the end piece.

[0006.6] The invention also provides for a motor pump system comprising a motor including a main body having an inlet end and an outlet end, a flow meter coupled to the inlet end, an outlet body coupled to the outlet end, and a pressure controller comprising an end piece and a fixed element which is removably coupled to the end piece, wherein the fixed element is coupled to the outlet body.

[0006.7] The main body may comprise a coil and a movable hollow piston. The flow meter may comprise a free bucket wheel and an electromagnetic detector. The fixed element may comprise a chamber, an electric contact disposed adjacent the chamber, a spring actuated cylindrical shutter, and a hollow piece having a passage which communicates with the chamber. The end piece may comprise a spring actuated movable bush and a valve adapted to close off a central passage. The outlet body may comprise a pressure limiting device, a cylindrical block, and at least two non-return valves disposed with the outlet body.

[0006.8] The invention also provides for a motor pump system comprising a motor including a main body having a first end and a second end, a flow meter coupled to the first end and having an inlet, an outlet body coupled to the second end and having an outlet, a pressure controller comprising a fixed element and an end piece, the fixed element comprising a movable cylindrical shutter and an outlet which is in fluid communication with the outlet of the outlet body, and the end piece coupled to a reservoir and comprising a movable valve, wherein the fixed element is removably coupled to the end piece.--

Please replace paragraphs 0007 - 0013 with the following section (see Appendix 3 for changes to this section):

--BRIEF DESCRIPTION OF THE DRAWINGS

[0007] In the annexed drawings, provided by way of a non-limiting example of one of the embodiments of the invention;

[0008] Figure 1 shows an axial cross-section of the motor pump having an incorporated flowmeter and pressure limiting device;

[0009] Figure 2 shows a transverse cross-section along the arrows F1 of Figure 1;

[0010] Figure 3 shows an enlarged front view of the bucket wheel of the flowmeter;

[0011] Figure 4 shows an axial cross-section along the arrows F2 of Figure 3;

[0012] Figures 5 and 6 show axial cross-sections of the two separated elements of the pressure controller; and

[0013] Figure 7 shows two elements of the pressure controller as assembled, under the same conditions, on a different scale.--

Please replace paragraphs 0014 - 0025 with the following section (see Appendix 4 for changes to this section):

--DETAILED DESCRIPTION OF THE INVENTION

[0014] The device illustrated in Figures 1-4, utilizes a liquid supply motor pump 1 having an integral assembly comprising an incorporated flowmeter 2 and pressure limiting device

3. Preferably, it is of the type having a hollow piston with an electromagnetic motor, but it can also be of the type having a controlled piston driven by a rotary engine. In the first case, it is advantageously provided with a main body 4, machined in a single piece made of plastic, one of its ends forming the coil 5 of the electromagnetic motor, the other end containing the cylinder block 6 in which the piston 7 moves, and comprising non-return valves 8 and 9.

[0015] The flow meter 2, located in a block closing the main body 4 on the side opposite the cylinder block 6, immediately after the water inlet 10 (see also Figure 2), is formed of a free bucket wheel 11 and comprises one or several permanent magnets 12 whose passage is detected by an electromagnetic detector 13, having a double function of allowing the stopping of the motor pump once the desired quantity of water has been obtained, and of signaling a possible flaw in the water inlet 10.

[0016] The pressure limiting device 3 is located in an outlet body 4' and has a bore provided in the cylinder block 6 containing a calibrated spring-loaded valve connecting the water outlet 14 to the base of the piston 7, such that water is recycled, without driving the flow meter 2 in the case of back pressure at the water outlet 14.

[0017] The arrangement of the water inlet 10 and of the flow meter 2 opposite the water outlet 14 causes the passage of water through the motive portion of the pump, along the axis of the latter, which makes it possible to have a direct flow substantially improving the functioning and reliability of the pump as shown by tests.

[0018] The motor pump 1 is advantageously associated with a pressure controller 20 mounted on the liquid supply circuit (see Figures 5-7).

[0019] This pressure controller 20 has a fixed element 21, affixed to the motor pump 1 or to the frame carrying the latter, and of an end piece 22 mounted at the base of the reservoir 23 and connected to it. These two elements constituting a quick connection can be separated so as to render the reservoir 23 detachable without any tool.

[0020] The fixed element 21 comprises an electric contact 24 formed of two electrodes and of a flexible membrane carrying a conducting plate that is normally moved away from these electrodes by an elastic device, and establishing the contact with one another when the weight of the liquid present in the reservoir 23 pushes back the flexible membrane, the decrease in pressure caused by the level drop in the reservoir having the opposite effect by moving the membrane and the conducting plate away from the electrodes, which cuts off the contact. This device constitutes a very reliable mechanism for controlling the automatic supply systems of the machine.

[0021] To avoid the repercussions of the variations in pressure caused by the starts and stops of the motor pump 1 on the membrane of the contact 24, the flow of the liquid penetrating in the pressure controller 20 is divided into two portions directed toward the chamber 25 containing the flexible membrane of the contact 24 and toward the outlet orifice 26 of the pressure controller 20, respectively. This is obtained due to two passages, a central

passage 27 leading to the chamber 25, on the one hand, and a peripheral passage 28 leading to the outlet orifice 26, on the other hand. These two passages are separated by a hollow piece 29 arranged in the body 30 of the fixed element 21 and extended by a bush 31 located in the end piece 22.

[0022] The bush 31 is axially movable and is associated with a spring so as to close the peripheral passage 28 during the separation of the fixed element 21 and of the end piece 22. Additionally, the central passage 27 is closed by a valve 32 which is also driven by a second spring, and slides in the bush 31.

[0023] The fixed element 21 is further provided with a cylindrical shutter 33 adapted to isolate the liquid circuit connected to the motor pump 1 so as to prevent the liquid remaining in the latter from flowing outside. Shutter 33 slides outside the hollow piece 29 and is actuated by a third spring.

[0024] The imperviousness of the assembly is ensured in a known fashion by a series of O-rings 34 resting on seats provided for this purpose.

[0025] The positioning of the various constituent elements provides the invention with a maximum of useful effects which, to date, had not been obtained by similar devices.--

Please add the following Abstract on the next page:

--ABSTRACT OF THE DISCLOSURE

Motor pump system includes an electromagnetic motor comprising a main body, a coil, and a movable hollow free piston. A flow meter is coupled to one end of the electromagnetic motor. A cylinder block is coupled to another end of the electromagnetic motor. At least two non-return valves are included. A water inlet, a water outlet, and a pressure limiting device are also provided. A motor pump system is also provided which includes a motor including a main body having an inlet end and an outlet end. A flow meter is coupled to the inlet end. An outlet body is coupled to outlet end. A pressure controller is provided comprising an end piece and a fixed element which is removably coupled to the end piece. The fixed element is coupled to the outlet body.--

Please cancel claims 1-4 without prejudice or disclaimer.

Please add the following new claims:

--5. A motor pump system comprising:

an electromagnetic motor comprising a main body, a coil, and a movable hollow free piston;

a flow meter coupled to one end of the electromagnetic motor;

a cylinder block coupled to another end of the electromagnetic motor;

at least two non-return valves;

a water inlet;

a water outlet; and

a pressure limiting device.

6. The system of claim 5, wherein the flow meter comprises a free bucket wheel.

7. The system of claim 6, wherein the flow meter further comprises an electromagnetic detector and wherein the free bucket comprises at least one permanent magnet whose movement is detected by the electromagnetic detector.

8. The system of claim 5, wherein the pressure limiting device is a bore provided in the cylinder block and comprises a calibrated spring-loaded valve which connects the water outlet to a base of the free hollow piston.

9. The system of claim 8, wherein motor pump is adapted to recycle water without driving the flow meter when there is back pressure at the water outlet.

10. The system of claim 5, wherein the main body is one of machined in a single piece and made of plastic.

11. The system of claim 5, wherein the motor pump is adapted to couple to an automatic coffee machine.

12. The system of claim 5, wherein the motor pump is adapted to couple to a device which requires a pressurized liquid supply from a reservoir.

13. The system of claim 5, further comprising a pressure controller associated with the motor pump.

14. The system of claim 13, wherein the pressure controller comprises a chamber.

15. The system of claim 14, wherein the chamber of the pressure controller is adapted to receive liquid flow.

16. The system of claim 14, wherein the pressure controller further comprises a flexible membrane actuating an electric contact for controlling an automatic liquid supply system.

17. The system of claim 13, wherein the pressure controller comprises an outlet orifice for communicating with the motor pump.

18. The system of claim 13, wherein the pressure controller is adapted to receive two liquid flows.

19. The system of claim 18, wherein one of the two flows is directed to a chamber in the pressure controller via a central passage and wherein another of the two flows is directed to an outlet orifice via a peripheral passage.

20. The system of claim 13, wherein the pressure controller comprises a fixed element and an end piece.

21. The system of claim 20, wherein the fixed element is coupled to one of the motor pump and a frame supporting the motor pump.

22. The system of claim 20, wherein the end piece is mounted to a reservoir.

23. The system of claim 22, wherein the reservoir communicates with and provides a supply to the motor pump.

24. The system of claim 20, wherein the fixed element and the end piece are releasably coupled together.

25. The system of claim 22, wherein the fixed element and the end piece are releasably coupled together via a quick connection.

26. The system of claim 13, wherein the pressure controller has a fixed element comprising a body, a hollow piece arranged within the body, and two passages separated by

the hollow piece.

27. The system of claim 26, wherein the pressure controller further comprises an end piece and an axially movable bush disposed within the end piece.

28. The system of claim 27, wherein the end piece further comprises a spring associated with the bush which is adapted to close a peripheral passage.

29. The system of claim 27, wherein the fixed element is removably coupled to the end piece such that when the fixed element is uncoupled from the end piece, a central passage is closed by a spring actuated valve.

30. The system of claim 27, wherein the bush is slidably disposed with the end piece and wherein the fixed element further comprises a cylindrical shutter which is slidably disposed around the hollow piece.

31. The system of claim 30, wherein the cylindrical shutter is biased via spring.

32. The system of claim 30, wherein the cylindrical shutter is adapted to isolate a

liquid circuit communicating with the motor pump so as to prevent a liquid remaining in the motor pump from flowing out of the fixed element when the fixed element is uncoupled from the end piece.

33. A motor pump system comprising:

a motor including a main body having an inlet end and an outlet end;

a flow meter coupled to the inlet end;

an outlet body coupled to outlet end; and

a pressure controller comprising an end piece and a fixed element which is removably coupled to the end piece,

wherein the fixed element is coupled to the outlet body.

34. The system of claim 33, wherein the main body comprises a coil, and a movable hollow piston.

35. The system of claim 33, wherein the flow meter comprises a free bucket wheel and an electromagnetic detector.

36. The system of claim 33, wherein the fixed element comprises a chamber, an

electric contact disposed adjacent the chamber, a spring actuated cylindrical shutter, and a hollow piece having a passage which communicates with the chamber.

37. The system of claim 33, wherein the end piece comprises a spring actuated movable bush and a valve adapted to close off a central passage.

38. The system of claim 33, wherein the outlet body comprises a pressure limiting device, a cylindrical block, and at least two non-return valves disposed with the outlet body.

39. A motor pump system comprising:

a motor including a main body having a first end and a second end;

a flow meter coupled to the first end and having an inlet;

an outlet body coupled to the second end and having an outlet;

a pressure controller comprising a fixed element and an end piece;

the fixed element comprising a movable cylindrical shutter and an outlet which is in fluid communication with the outlet of the outlet body; and

the end piece coupled to a reservoir and comprising a movable valve,

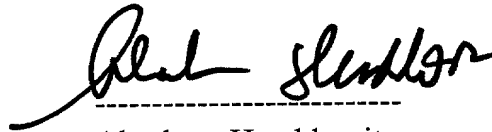
wherein the fixed element is removably coupled to the end piece.--

REMARKS

Upon entry of this amendment, claims 5-39 will be pending with claims 5, 33 and 39 being independent. This amendment is being made to even more clearly recite the features of the invention. If there are any comments or questions concerning this preliminary amendment or this application, they can be directed to the undersigned at telephone number (703) 716-1191.

The Commissioner is hereby authorized to charge any additional fee necessary to have this paper entered to Deposit Account No. 19-0089.

Respectfully submitted,
R. VERSINI



Abraham HersHKovitz
Reg. No. 45,294

March 30, 2001
GREENBLUM & BERNSTEIN, P.L.C.
1941 Roland Clarke Place
Reston, VA 20191
(703) 716-1191

Attachments: Appendix 1-4.

APPENDIX 1

Changes to the title and background of the invention section on page 1 of the specification (i.e., the title and paragraphs 0001 - 0004):

**--MOTOR PUMP SYSTEM WITH AXIAL THROUGH FLOW UTILIZING AN
INCORPORATED FLOWMETER AND PRESSURE CONTROLLER
CROSS-REFERENCE TO RELATED APPLICATIONS--**

The present application is a National Stage Application of International Application No. PCT/FR99/01158, filed May 14, 1999. Further, the present application claims priority under 35 U.S.C. § 119 of French Patent Application Nos. 98/06431 and 98/10989, both filed on May 15, 1998.

--BACKGROUND OF THE INVENTION

1. Field of the Invention--

[0001] The present invention relates to an axial through flow motor pump with an incorporated flowmeter and pressure controller.

[0002] [It] The invention is particularly adapted to equip automatic coffee machines, but it can be used for numerous other applications requiring pressurized liquid supply from a reservoir.

--2. Discussion of Background Information--

[0003] The French Patent No. FR 98 06 431 filed by the Applicant of the present invention describes a coffee machine comprising a motor pump associated with a pressure controller mounted on the supply circuit and making it possible not only to control the water supply system, but also to remove the reservoir to fill it up due to the fact that [said] the pressure controller is constituted of two elements that can be coupled, one of which is fixed on the frame of the machine and the other to the base of the reservoir, each of these two elements being automatically sealed when they are separated.

[0004] The fixed element is connected to the motor pump and is equipped with a flexible membrane acting on an electric contact as a function of the variations in pressure generated by the

P20178.A03

modifications of the water level in the reservoir. The liquid that penetrates into this element converges to a single chamber in which the flexible membrane and the outlet orifice toward the motor pump are located. Under certain conditions, this arrangement causes an aberrant functioning of the electric contact, in particular during stops and starts of the motor pump.

TOP SECRET

APPENDIX 2

Changes to paragraphs 0005 - 0006:

--SUMMARY OF THE INVENTION--

[0005] The [object of the] device according to the present invention [is to obtain] provides for a system which uses a motor pump incorporating the assembly of the devices for controlling the liquid flow and connected to a particularly reliable supply pressure controller.

[0006] [It is constituted of] The invention utilizes an internal axial flow motor pump, with an electromagnetic motor and a hollow free piston, equipped with an incorporated flowmeter and flow limiting device, and associated with a pressure controller adapted to control its supply and comprising separate internal passages for the liquid flow converging to the motor pump and for connecting to a chamber containing a flexible membrane actuating an electric contact for controlling the motor pump power supply.

[0006.1] According to one aspect of the invention, there is provided a motor pump system comprising an electromagnetic motor comprising a main body, a coil, and a movable hollow free piston, a flow meter coupled to one end of the electromagnetic motor, a cylinder block coupled to another end of the electromagnetic motor, at least two non-return valves, a water inlet, a water outlet, and a pressure limiting device.

[0006.2] The flow meter may comprise a free bucket wheel. The flow meter may further comprise an electromagnetic detector and the free bucket may comprise at least one permanent magnet whose movement is detected by the electromagnetic detector. The pressure limiting device may be a bore provided in the cylinder block and may comprise a calibrated spring-loaded valve which connects the water outlet to a base of the free hollow piston. The motor pump may be adapted to recycle water without driving the flow meter when there is back pressure at the water outlet.

[0006.3] The main body may be one of machined in a single piece and made of plastic.

The motor pump may be adapted to couple to an automatic coffee machine. The motor pump may be adapted to couple to a device which requires a pressurized liquid supply from a reservoir. The system may further comprise a pressure controller associated with the motor pump. The pressure controller may comprise a chamber. The chamber of the pressure controller may be adapted to receive liquid flow. The pressure controller may further comprise a flexible membrane actuating an electric contact for controlling an automatic liquid supply system. The pressure controller may comprise an outlet orifice for communicating with the motor pump. The pressure controller may be adapted to receive two liquid flows. One of the two flows may be directed to a chamber in the pressure controller via a central passage and another of the two flows may be directed to an outlet orifice via a peripheral passage.

[0006.4] The pressure controller may comprise a fixed element and an end piece. The fixed element may be coupled to one of the motor pump and a frame supporting the motor pump. The end piece may be mounted to a reservoir. The reservoir may communicate with and provide a supply to the motor pump. The fixed element and the end piece may be releasably coupled together. The fixed element and the end piece may be releasably coupled together via a quick connection.

[0006.5] The pressure controller may have a fixed element comprising a body, a hollow piece arranged within the body, and two passages separated by the hollow piece. The pressure controller may further comprise an end piece and an axially movable bush disposed within the end piece. The end piece may further comprise a spring associated with the bush which is adapted to close a peripheral passage. The fixed element may be removably coupled to the end piece such that when the fixed element is uncoupled from the end piece, a central passage is closed by a spring actuated valve. The bush may be slidably disposed with the end piece and the fixed element may further comprise a cylindrical shutter which is slidably disposed around the hollow piece. The cylindrical shutter may be biased via a spring. The

cylindrical shutter may be adapted to isolate a liquid circuit communicating with the motor pump so as to prevent a liquid remaining in the motor pump from flowing out of the fixed element when the fixed element is uncoupled from the end piece.

[0006.6] The invention also provides for a motor pump system comprising a motor including a main body having an inlet end and an outlet end, a flow meter coupled to the inlet end, an outlet body coupled to the outlet end, and a pressure controller comprising an end piece and a fixed element which is removably coupled to the end piece, wherein the fixed element is coupled to the outlet body.

[0006.7] The main body may comprise a coil and a movable hollow piston. The flow meter may comprise a free bucket wheel and an electromagnetic detector. The fixed element may comprise a chamber, an electric contact disposed adjacent the chamber, a spring actuated cylindrical shutter, and a hollow piece having a passage which communicates with the chamber. The end piece may comprise a spring actuated movable bush and a valve adapted to close off a central passage. The outlet body may comprise a pressure limiting device, a cylindrical block, and at least two non-return valves disposed with the outlet body.

[0006.8] The invention also provides for a motor pump system comprising a motor including a main body having a first end and a second end, a flow meter coupled to the first end and having an inlet, an outlet body coupled to the second end and having an outlet, a pressure controller comprising a fixed element and an end piece, the fixed element comprising a movable cylindrical shutter and an outlet which is in fluid communication with the outlet of the outlet body, and the end piece coupled to a reservoir and comprising a movable valve, wherein the fixed element is removably coupled to the end piece.

APPENDIX 3

Changes to paragraphs 0007 - 0013:

--BRIEF DESCRIPTION OF THE DRAWINGS--

[0007] In the annexed drawings, provided by way of a non-limiting example of one of the embodiments of the [object of the] invention:

[0008] Figure 1 [is] shows an axial cross-section of the motor pump having an incorporated flowmeter and pressure limiting device[,];

[0009] Figure 2 [is] shows a transverse cross-section along the arrows F1 of Figure 1[,];

[0010] Figure 3 [is] shows an enlarged front view of the bucket wheel of the flowmeter[,];

[0011] Figure 4 [is] shows an axial cross-section along the arrows F2 of Figure 3[,];

[0012] Figures 5 and 6 [are] show axial cross-sections of the two separated elements of the pressure controller[,]; and

[0013] Figure 7 shows [these] two elements of the pressure controller as assembled, under the same conditions, [at] on a different scale.

Changes to paragraphs 0014 - 0025:

[0014] The device[,] illustrated in Figures 1-4, [is constituted of] utilizes a liquid supply motor pump 1 [consisting of] having an integral assembly comprising an incorporated flowmeter 2 and pressure limiting device 3. Preferably, it is of the type having a hollow piston with an electromagnetic motor, but it can also be of the type having a controlled piston driven by a rotary engine. In the first case, it is advantageously [constituted of] provided with a main body 4, machined in a single piece made of plastic, one of its ends forming the coil 5 of the electromagnetic motor, the other end containing the cylinder block 6 in which the piston 7 moves, and comprising non-return valves 8 and 9.

[0015] The flow meter 2, located in a block closing the main body 4 on the side opposite the cylinder block 6, immediately after the water inlet 10 (see also Figure 2), is formed of a free bucket wheel 11 and comprises one or several permanent magnets 12 whose passage is detected by an electromagnetic detector 13, having a double function of allowing [to stop] the stopping of the motor pump once the desired quantity of water has been obtained, and of signaling a possible flaw in the water inlet 10.

[0016] The pressure limiting device 3 is [constituted of] located in an outlet body 4' and has a bore provided in the cylinder block 6 containing a calibrated spring-loaded valve connecting the water outlet 14 to the base of the piston 7, such that water is recycled, without driving the flow meter 2 in the case of back pressure at [said] the water outlet 14.

[0017] The arrangement of the water inlet 10 and of the flow meter 2 opposite the water outlet 14 causes the passage of water through the motive portion of the pump, along the axis of the latter, which makes it possible to have a direct flow substantially improving the functioning and reliability of the pump as shown by [the] tests.

[0018] The motor pump 1 is advantageously associated with a pressure controller 20 mounted on the liquid supply circuit (see Figures 5-7).

[0019] This pressure controller 20 has [is constituted of] a fixed element 21, affixed to the motor pump 1 or to the frame carrying the latter, and of an end piece 22 mounted at the base of the reservoir 23 and connected to it. These two elements constituting a quick connection can be separated so as to render the reservoir 23 detachable without any tool.

[0020] The fixed element 21 comprises an electric contact 24 formed of two electrodes and of a flexible membrane carrying a conducting plate that is normally moved away from these electrodes by an elastic device, and establishing the contact with one another when the weight of the liquid present in the reservoir 23 pushes back the flexible membrane, the decrease in pressure caused by the level drop in the reservoir having the opposite effect by moving the membrane and the conducting plate away from the electrodes, which cuts off the contact. This device constitutes a very reliable [means] mechanism for controlling the automatic supply systems of the machine.

[0021] To avoid the repercussions of the variations in pressure caused by the starts and stops of the motor pump 1 on the membrane of the contact 24, the flow of the liquid penetrating in the pressure controller 20 is divided into two portions directed toward the chamber 25 containing the flexible membrane of the contact 24 and toward the outlet orifice 26 of the pressure controller 20, respectively. This is obtained due to two passages[:], a central passage 27 leading to the chamber 25, on the one hand, and a peripheral passage 28 leading to the outlet orifice 26, on the other hand. These two passages are separated by a hollow piece 29 arranged in the body 30 of the fixed element 21 and extended by a bush 31 located in the end piece 22.

[0022] The bush 31 is axially movable and is associated with a spring so as to close the peripheral passage 28 during the separation of the fixed element 21 and of the end piece 22[.]. Additionally, the central passage 27 [being] is closed by a valve 32 which is also

[0023] The fixed element 21 is further provided with a cylindrical shutter 33 adapted to isolate the liquid circuit connected to the motor pump 1 so as to prevent the liquid remaining in the latter from flowing outside[, this shutter]. Shutter 33 slides [sliding] outside the hollow piece 29 and [being] is actuated by a third spring.

[0025] The positioning of the various constituent elements provides [the object of] the invention with a maximum of useful effects which, to date, had not been obtained by similar devices.

**MOTOR PUMP WITH AXIAL THROUGH FLOW COMPRISING AN
INCORPORATED FLOWMETER AND PRESSURE CONTROLLER**

[0001] The present invention relates to an axial through flow motor pump with an incorporated flowmeter and pressure controller.

[0002] It is particularly adapted to equip automatic coffee machines, but it can be used for numerous other applications requiring pressurized liquid supply from a reservoir.

[0003] The French Patent No. FR 98 06 431 filed by the Applicant of the present invention describes a coffee machine comprising a motor pump associated with a pressure controller mounted on the supply circuit and making it possible not only to control the water supply system, but also to remove the reservoir to fill it up due to the fact that said pressure controller is constituted of two elements that can be coupled, one of which is fixed on the frame of the machine and the other to the base of the reservoir, each of these two elements being automatically sealed when they are separated.

[0004] The fixed element is connected to the motor pump and is equipped with a flexible membrane acting on an electric contact as a function of the variations in pressure generated by the modifications of the water level in the reservoir. The liquid that penetrates into this element converges to a single chamber in which the flexible membrane and the outlet orifice toward the motor pump are located. Under certain conditions, this arrangement causes an aberrant functioning of the electric contact, in particular during stops and starts of the motor pump.

[0005] The object of the device according to the present invention is to obtain a motor pump incorporating the assembly of the devices for controlling the liquid flow and connected to a particularly reliable supply pressure controller.

[0006] It is constituted of an internal axial flow motor pump, with an electromagnetic motor and a hollow free piston, equipped with an incorporated flowmeter and flow limiting device, and associated with a pressure controller adapted to control its supply and comprising separate internal passages for the liquid flow converging to the motor

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pump and for connecting to a chamber containing a flexible membrane actuating an electric contact for controlling the motor pump power supply.

[0007] In the annexed drawings, provided by way of a non-limiting example of one of the embodiments of the object of the invention:

[0008] Figure 1 is an axial cross-section of the motor pump having an incorporated flowmeter and pressure limiting device,

[0009] Figure 2 is a transverse cross-section along the arrows F1 of Figure 1,

[0010] Figure 3 is an enlarged front view of the bucket wheel of the flowmeter,

[0011] Figure 4 is an axial cross-section along the arrows F2 of Figure 3,

[0012] Figures 5 and 6 are axial cross-sections of the two separated elements of the pressure controller, and

[0013] Figure 7 shows these two elements as assembled, under the same conditions, at a different scale.

[0014] The device, Figures 1-4, is constituted of a liquid supply motor pump 1 consisting of an integral assembly comprising an incorporated flowmeter 2 and pressure limiting device 3. Preferably, it is of the type having a hollow piston with an electromagnetic motor, but it can also be of the type having a controlled piston driven by a rotary engine. In the first case, it is advantageously constituted of a main body 4, machined in a single piece made of plastic, one of its ends forming the coil 5 of the electromagnetic motor, the other end containing the cylinder block 6 in which the piston 7 moves, and comprising non-return valves 8 and 9.

[0015] The flow meter 2, located in a block closing the main body 4 on the side opposite the cylinder block 6, immediately after the water inlet 10 (Figure 2), is formed of a free bucket wheel 11 and comprises one or several permanent magnets 12 whose passage

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[0016] The pressure limiting device 3 is constituted of a bore provided in the cylinder block 6 containing a calibrated spring-loaded valve connecting the water outlet 14 to the base of the piston 7, such that water is recycled, without driving the flow meter 2 in the case of back pressure at said water outlet.

[0018] The motor pump 1 is advantageously associated with a pressure controller 20 mounted on the liquid supply circuit (Figures 5-7).

[0020] The fixed element 21 comprises an electric contact 24 formed of two electrodes and of a flexible membrane carrying a conducting plate that is normally moved away from these electrodes by an elastic device, and establishing the contact with one another when the weight of the liquid present in the reservoir 23 pushes back the flexible membrane, the decrease in pressure caused by the level drop in the reservoir having the opposite effect by moving the membrane and the conducting plate away from the electrodes, which cuts off the contact. This device constitutes a very reliable means for controlling the automatic supply systems of the machine.

[0021] To avoid the repercussions of the variations in pressure caused by the starts and stops of the motor pump 1 on the membrane of the contact 24, the flow of the liquid

[0022] The bush 31 is axially movable and is associated with a spring so as to close the peripheral passage 28 during the separation of the fixed element 21 and of the end piece 22, the central passage 27 being closed by a valve 32 which is also driven by a second spring, and slides in the bush 31.

[0024] The imperviousness of the assembly is ensured in a known fashion by a series of O-rings 34 resting on seats provided for this purpose.

[0025] The positioning of the various constituent elements provides the object of the invention with a maximum of useful effects which, to date, had not been obtained by similar devices.

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CLAIMS

1. Axial through flow motor pump with an incorporated flowmeter, especially adapted to equip an automatic coffee machine, but which can be used for numerous other applications requiring pressurized liquid supply from a reservoir,

characterized in that it is of the type having a hollow free piston with an electromagnetic motor, and in that it is constituted of a main body (4), machined in a single piece made of plastic, one of its ends forming the coil (5) of the electromagnetic motor, the other end containing the cylinder block (6) in which the piston (7) moves, and comprising non-return valves (8 and 9), the flow meter (2), located in a block closing the main body (4) on the side opposite the water outlet (14), immediately after the water inlet (10), being formed of a free bucket wheel (11) comprising one or several permanent magnets (12) whose passage is detected by an electromagnetic detector (13), and the pressure limiting device (3) being constituted of a bore provided in the cylinder block (6) containing a calibrated spring-loaded valve connecting the water outlet (14) to the base of the piston (7), such that water is recycled, without driving the flow meter (2) in the case of back pressure at said water outlet.

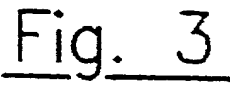
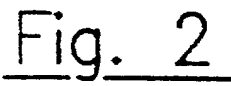
2. Motor pump according to claim 1, characterized in that it is associated with a pressure controller (20) mounted on the supply circuit and in which the flow of the liquid is divided into two portions directed toward a chamber (25) containing a flexible membrane actuating an electric contact (24) for controlling the automatic liquid supply systems, and toward the outlet orifice (26) of the pressure controller communicating with the motor pump (1), respectively, the portion of flow converging to the chamber (25) along a central passage (27), and that converging to the outlet orifice (26) along a peripheral passage (28).

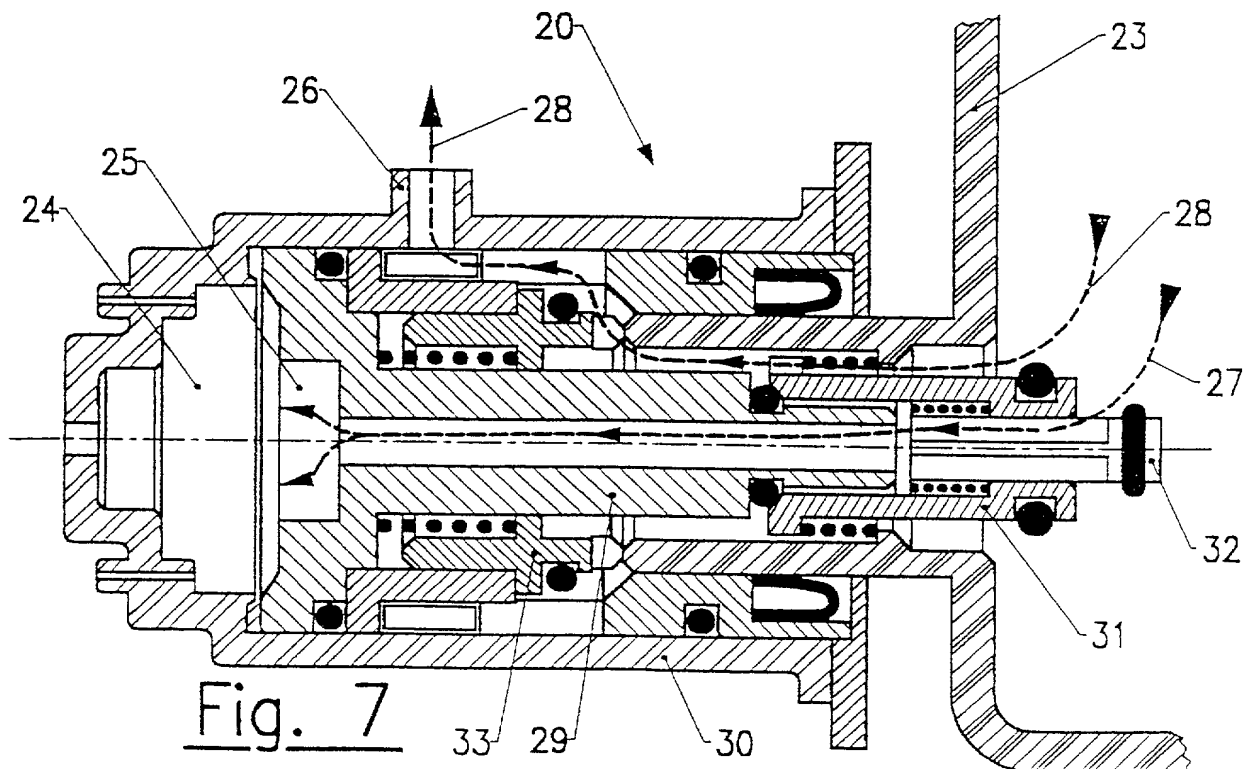
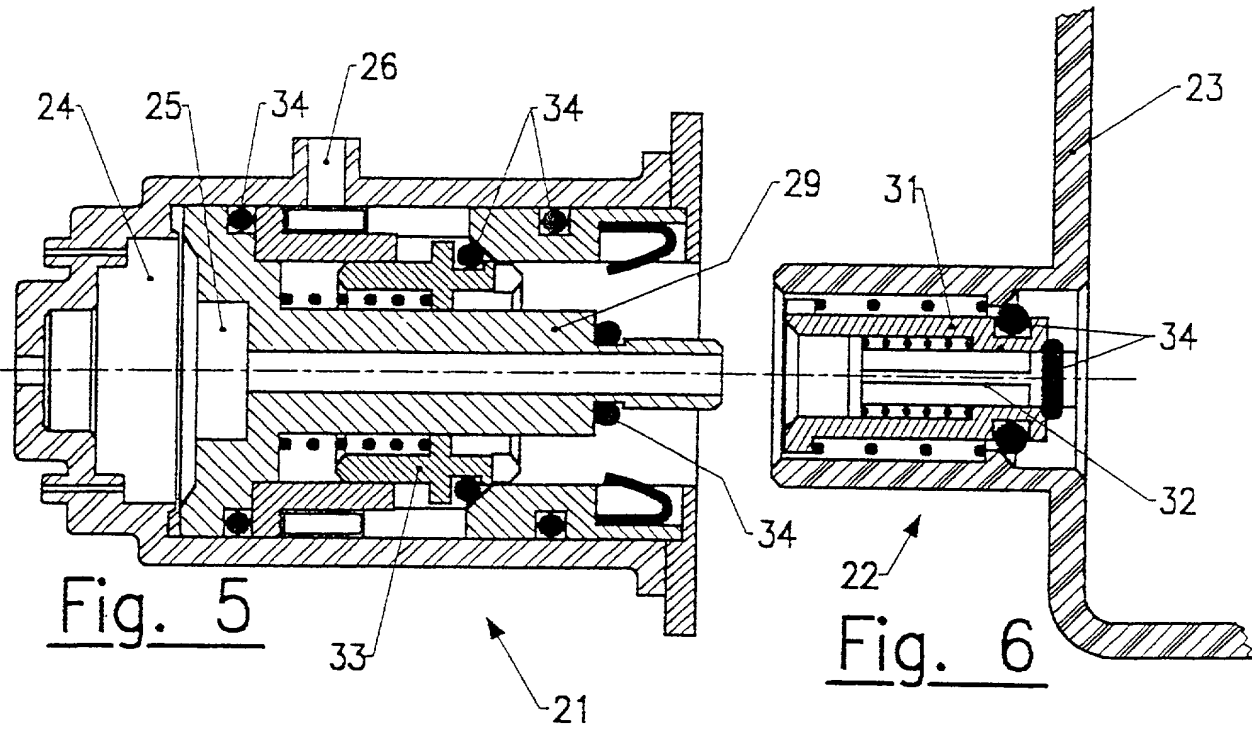
3. Motor pump according to claim 2, characterized in that the pressure controller (20) is constituted of a fixed element (21), affixed to the motor pump (1) or to the frame carrying the latter, and of an end piece (22) mounted at the base of the reservoir (23) supplying said motor pump and communicating with it, these two elements constituting a quick connection that can be separated so as to render said reservoir detachable without any tool.

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4. Motor pump according to any of claims 2 and 3, characterized in that the two passages (27, 28) are separated by a hollow piece (29) arranged in the body (30) of the fixed element (21) and extended by a bush (31) located in the end piece (22), the bush (31) being axially movable and associated with a spring so as to close the peripheral passage (28) during the separation of the fixed element (21) and of the end piece (22), the central passage (27) being closed by a valve (32) which is driven by a second spring, and sliding in the bush (31), the fixed element (21) further comprising a cylindrical shutter (33) sliding outside the hollow piece (29), actuated by a third spring and arranged so as to isolate the liquid circuit communicating with the motor pump (1) so as to prevent the liquid remaining in the latter from flowing outside.

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COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY

(Includes Reference to PCT International Applications)

ATTORNEY'S DOCKET NUMBER

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

Motor pump with axial through flow comprising an incorporated flowmeter and pressure controller

the specification of which (check only one item below):

☒ is attached hereto.

☐ was filed as United States application

Serial No. _____

on _____,

and was amended

on _____ (if applicable).

☒ was filed as PCT international application

Number PCT/FR99/01158

on 14/may/1999,

and was amended under PCT Article 19

on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. 119:

COUNTRY (in PCT, indicate PCT)	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 35 USC 119
FRANCE	9810989	15 mai 1998	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO
			<input type="checkbox"/> YES <input type="checkbox"/> NO

Combined Declaration For Patent Application and Power of Attorney (Continued)

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I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application:

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	POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY
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	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
	POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY
203	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
	RESIDENCE & CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

SIGNATURE OF INVENTOR 201

SIGNATURE OF INVENTOR 202

SIGNATURE OF INVENTOR 203

DATE

23 octobre 2000

DATE

DATE